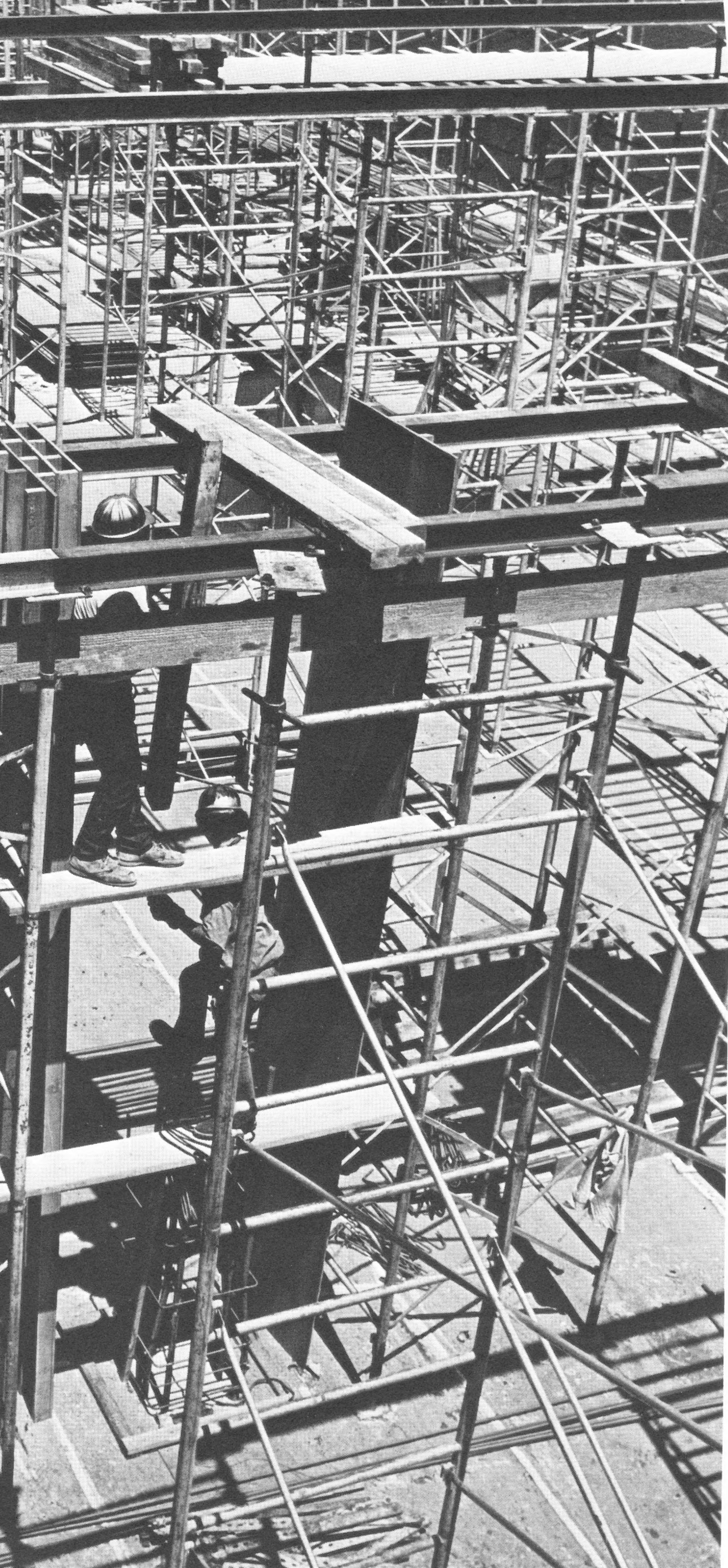


CALIFORNIA
ACADEMY
OF
SCIENCES
ANNUAL
REPORT
1973-74





Patterns of construction in the development of the California Academy of Sciences to better serve San Francisco and the nation with programs of research and education in the natural and environmental sciences.

CALIFORNIA ACADEMY OF SCIENCES

ANNUAL REPORT

1973-74

A MESSAGE FROM THE CHAIRMAN	3
REPORT OF THE DIRECTOR	4
RESEARCH ACTIVITIES	11
VOLUNTEERS	15
STAFF	16
STAFF BIBLIOGRAPHY	18
FINANCIAL STATEMENT	20
CONTRIBUTORS	24

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Paul L. Davies, Jr.



Paul L. Wattis



Wilson Meyer

A MESSAGE FROM THE CHAIRMAN

THIS is my first message as chairman of the Academy's Board of Trustees. My initial words must be ones of thanks—to George Lindsay, our Director, Bob Orr, Associate Director, and the outstanding staff of the Academy, for the superb job they have done and are doing in operating and expanding our institution. My thanks must also go to my predecessor, E. Morris Cox, for the fine job which he did through six years as chairman of the Academy Board and to my fellow Trustees who have been a source of constant support and steady guidance through this learning period.

In the January 1974 groundbreaking ceremonies, the Academy embarked on the most significant expansion of its career. The addition of Wattis Hall will give us an anthropology museum which will round out our public facilities so that the Academy will be a complete natural science museum. Above Wattis Hall we shall have space for expanded scientific departments, thus easing the congestion the Academy presently experiences.

The Meyer Fish Roundabout will add an element to our aquarium facilities which is as yet unknown in this country. This gigantic fish tank will provide a new dimension among aquaria; the only two comparable such installations of which I am aware are in Japan.

As we proceed with these expansions of our institution, both of which should be completed by the time of our next annual report, it is appropriate that we should express our gratitude for having known two wonderful men, and to their families for the gifts made to the Academy in memory of them. Paul L. (Pat) Wattis was a prominent figure in San Francisco for many years. His love of the outdoors and nature was conspicuous to all who knew him. The gift

of the Paul L. and Phyllis Wattis Foundation has provided the base from which we have set forth to raise the remaining funds for the Hall of Anthropology.

Wilson Meyer served more than 15 years as a Trustee of the Academy and his last year on the Board was dedicated to advancing the concept of the fish roundabout. The Meyer family had made an initial pledge toward this project prior to the time of Wilson's death. Subsequent to that unfortunate event the G. H. C. Meyer Family Foundation agreed to underwrite the full cost of the fish roundabout, and it will stand as a lasting memorial to a wonderful, inspirational individual.

In conjunction with these expansions of our facilities, we set a goal of raising \$6.5 million. We thus far have committed, on a formal or informal basis, approximately \$5 million of this sum. (By "informal" I mean we actually have no written commitment as to amount or timing, but merely a verbal expression of intent.) The support received has been widespread—members, friends, institutions—and we are deeply grateful for each gift, large and small. The balance must be raised in the next year—or at the most, two—to pay for the buildings and to provide the endowment necessary to support our enlarged operations. All of the Trustees will dedicate themselves to this undertaking, and we solicit the aid of the Academy's membership as well.

I know that all of us are familiar with the phenomenon of rising costs. The Academy also is experiencing these. Our 1974-75 budget indicates operating expenses will increase approximately 9.45%. This means that we shall have to secure additional contributions for current support at the same time we are raising the endowment funds referred to in the preceding paragraph.

From what I have said, it will be obvious that the Academy's staff and its Trustees face a challenging year. With the continued support of the community and the Academy's membership we shall meet this challenge successfully.

Paul L. Davies, Jr.

PAUL L. DAVIES, JR.
Chairman, Board of Trustees

Simultaneous
ground-breaking
ceremonies for the
Wattis Hall of Man
and the Meyer Fish
Roundabout were held
on January 16, 1974.
Upper right:
Mrs. Paul L. Wattis
and Paul L. Wattis, Jr.,
with Paul L. Davies,
Jr., George Lindsay,
and E. Morris Cox.
Lower left:
Mrs. Wilson Meyer,
her daughter
Mrs. Charles Quarré,
and Jeffery W. Meyer.
Lower right: The Meyer
Fish Roundabout
takes form, as does
the Wattis Hall of
Man, upper left.

REPORT OF THE DIRECTOR

ACTIVITIES of construction followed the January 16, 1974 groundbreaking ceremonies for the Wattis Hall of Man and for the Meyer Fish Roundabout. A long period of anticipation, preparation, and frustration was ended. Exciting developments of new dimensions for the Academy were underway—a beautiful and spacious hall in which to tell the story of mankind, a magnificent concept in aquarium exhibition not before seen in the western world, and new areas for expanding research departments, scientific collections, and museum activities.

This, the 121st year of the Academy's service to science and people, was not an easy one. But in spite of the national malaise, a city-wide strike, the gasoline shortage, Sunday closure of the park to vehicles, and an acute lack of public parking, attendance was 1,201,912. While this is 8.1% below that of the previous year, Morrison Planetarium attendance increased and the Academy Buffet and Sales Desks were busier than ever.

Highlights of the year included the acquisition and partial exhibition of the important Carl L. Reitz collection of artifacts related to food, and the gift to the Academy of sculptures of sea lions and dolphins by the artist who created them, Victor J. "Trader Vic" Bergeron. The Fellows' Medal, the highest honor the Academy can bestow, was presented to two recipients at the Fellows' Banquet October 27, 1973. They were Dean E. Gorton Linsley of the College of Agricultural Sciences, University of California, Berkeley and long a Research Associate in the Entomology Department, and Dr. Robert T. Orr, author, teacher, and Associate Director of the Academy. Dr. Jane Goodall addressed the Fellows on that occasion. There were many other positive

developments and acquisitions and activities, as will be related in this report of the 1973-74 fiscal year.

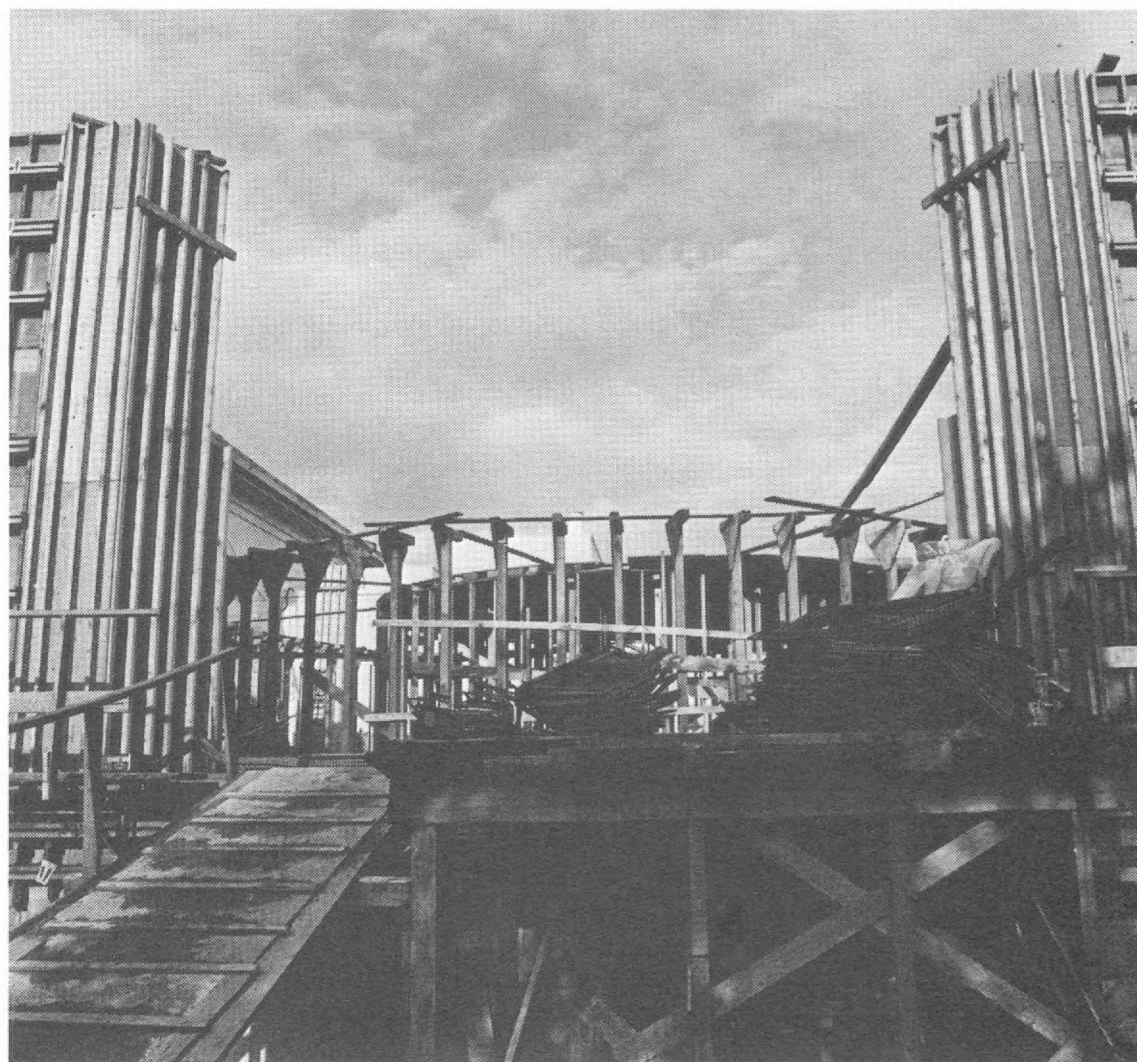
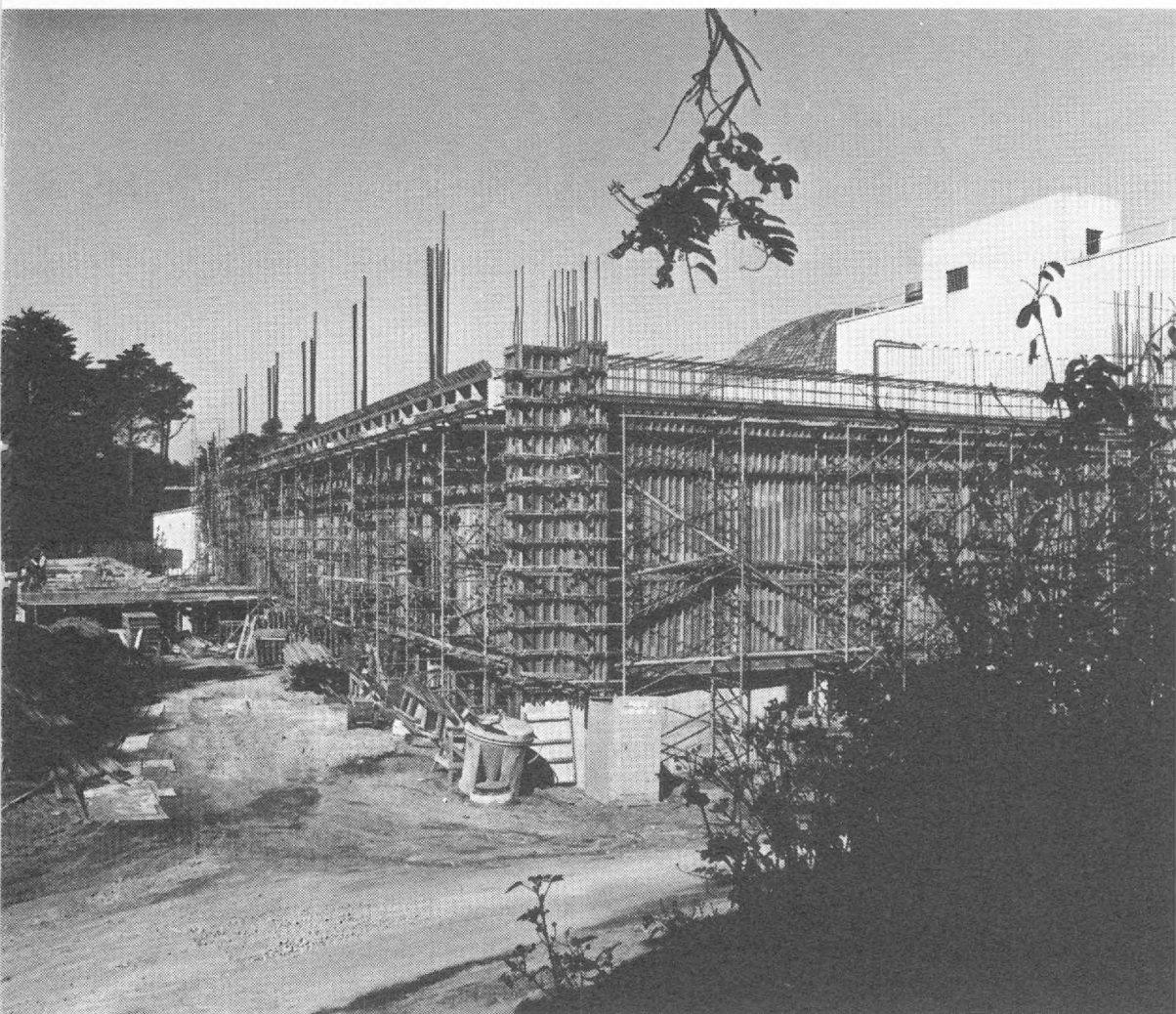
PUBLIC ACTIVITIES

The California Academy of Sciences is concerned with the exploration and interpretation of the natural and environmental sciences. Exploration includes all phases of research in the laboratories and systematic collections, as well as expeditions in the field, and the publication of the results of that research. Interpretation encompasses the exhibitions in the museums, aquarium, and planetarium, the publication of a popular nature magazine, meetings, organized classes and trips, the Junior Academy, and all educational and "public" activities.

STEINHART AQUARIUM

John E. McCosker, Superintendent. Dr. McCosker was appointed Acting Superintendent of Steinhart Aquarium September 1, 1973, and became Superintendent on June 15, 1974.

The Aquarium celebrated its 50th year of operation with further growth and expansion of its collections and activities, as evidenced by the accession of 14,159 live animals, most of which were collected by the staff. Important gifts included Mexican reptiles and amphibians from Elkan Morris, Philippine marine fishes from Japan Airlines and Lloyd Gomez, a collection of large freshwater tropical fishes



from Mary Taylor, rare reptiles including a gravid female green tree python and ringed pythons collected in New Guinea by Karl Switak, Hawaiian marine fishes from Jane Culp, and large shipments of marine fishes collected by the Steinhart Divers on trips to the Sea of Cortez, the Bahamas, and Hawaii. Steinhart Divers are enthusiastic avocational divers who constitute an informal and most valuable Aquarium auxiliary group.

Through Mr. Vic Breeden, the Charlene Breeden Foundation provided a grant of \$11,416 for the study of maintenance of midwater fishes and invertebrates in captivity. Mr. Breeden and the foundation were also generous

sponsors of other Aquarium activities and projects.

Academy Trustee Jeffery Meyer furnished his boats, "Grunt" and "Grunt II" for offshore collecting of live fishes for the Aquarium and for the Ichthyology Department.

Ambitious field programs were accomplished during the year. Dr. McCosker was involved in diving studies at Santa Cruz Island, collecting at Santa Catalina Island, collecting with Steinhart Divers in the Bahamas, and with the Smithsonian Tropical Research Institute at Panama. Karl Switak collected reptiles in New Guinea, New Ireland, and New Britain. Lloyd Gomez "vacationed" in the Philippines and brought back a fine collection of tropical marine fishes.



Steinhart Aquarium is the most popular of the public areas of the Academy. It is also a center for research projects and programs, and its staff members are involved in teaching and research at the Academy and other institutions and agencies.

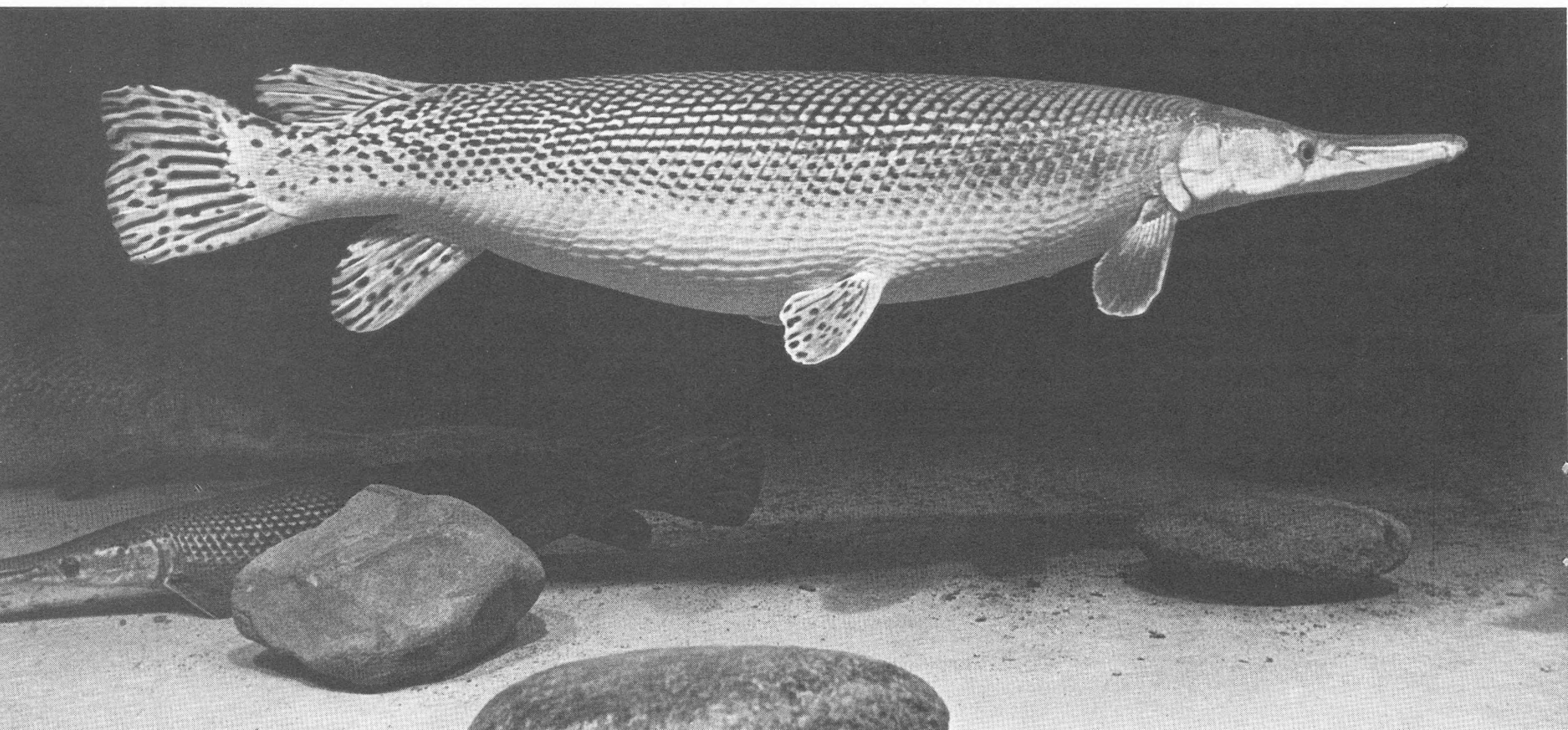
MORRISON PLANETARIUM

Robert D. Risser, Supervisor. The great dome of Morrison Planetarium held the fascinated interest of 150,881 people who attended the 950 performances of six different shows during the year. And 27,867 children in school classes came to 126 special educational programs, to make a total 1076 performances which were viewed by 178,748 people. This was a substantial increase over the previous year, in spite of a decrease of 6,674 in school group attendance because of a school bus fuel shortage.

Adult classes were again presented, "Celestial Navigation" by David Todd and Frank Matthews, and "Astronomy for Fun" by Don Warren. Planetarium Staff personnel again conducted the popular parent-participation astronomy course for the Junior Academy.

DEVELOPMENT AND MEMBERSHIP

Mrs. Kathleen F. Bowman, Development Officer. The Development Office worked with the Board of Trustees seeking financial support from corporations, foundations, and individuals. Membership promotion was carried on through special events, travel programs and mail campaigns. Mrs. Ernest R. Lilienthal served as chairman of the Trustees'



Upper: Dr. John McCosker and docent Lynn Dunne compare rockfish swimbladders during the Aquarium docent training course. Lower: alligator gar, an Aquarium resident of more than 26 years.

Left: Aquatic Biologist Lloyd Gomez "vacationed" in the Philippine Islands, and returned with a large collection of tropical fish for Steinhart Aquarium. Right: Academy members at Punta Espinosa, Galápagos Islands.



Membership Committee, Mr. John A. Sutro chaired the "Friends of the Academy" Committee, a special group of member-donors, and Mr. Frank E. Hayward continued as chairman of the Trustees' Corporate Support Committee.

On July 1, 1974 there were 7,397 adult and 515 junior members, as compared to 7,456 adult and 452 junior members on July 1, 1973. There was no membership drive during the year.

The Travel Program was directed by volunteer Mrs. George Lindsay through the Membership Committee. There were 483 participants on trips to the Galápagos Islands and South America, Mexico City and the Yucatan Peninsula, Mt. Lassen, and the Monterey Peninsula. Other field trips included a one day Bay cruise and a mushroom walk. Academy staff members led all the excursions.

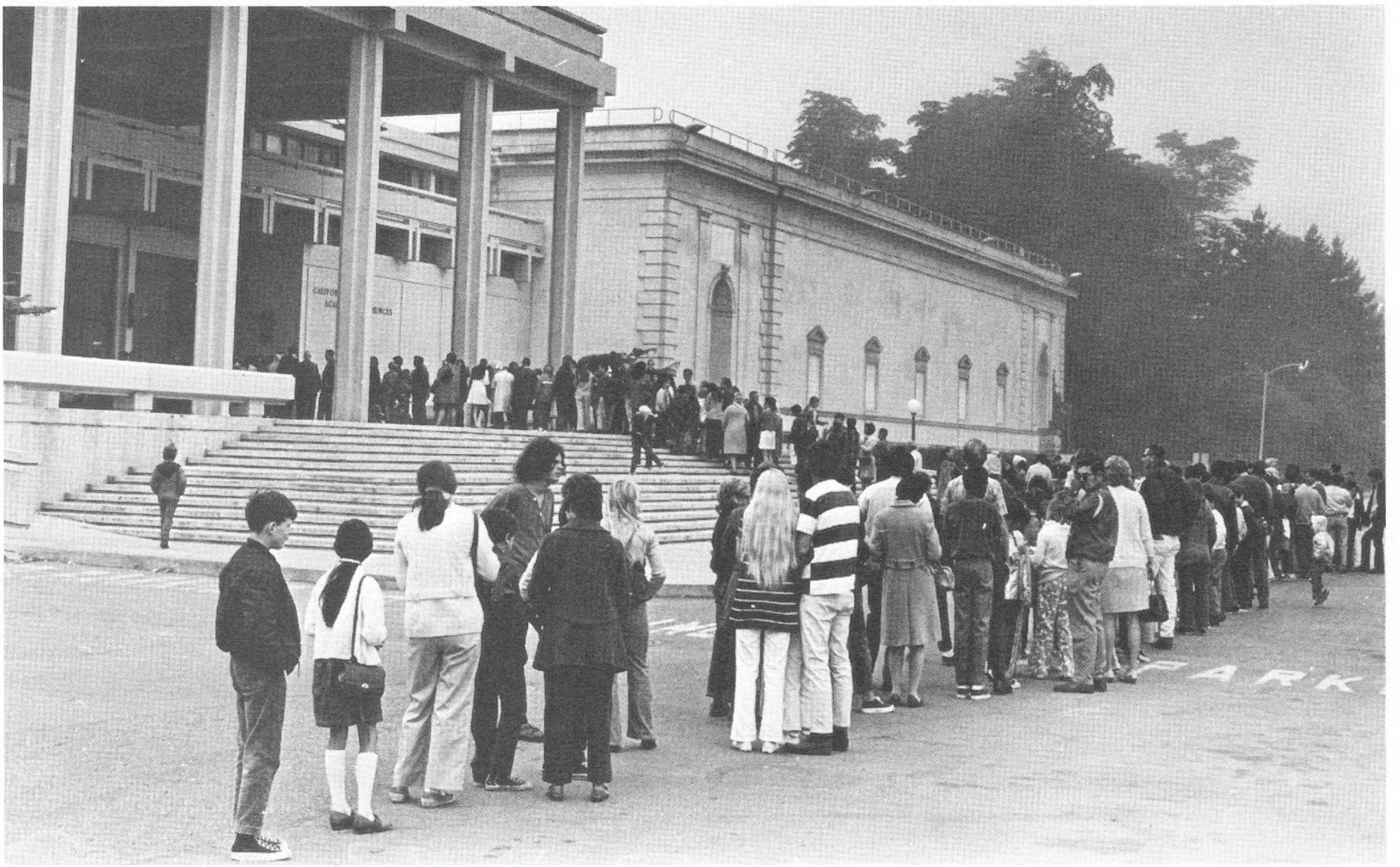
An information Desk staffed by Academy volunteers was put into operation during the fall of 1973. Under the aegis of Docents Mrs. Edward Schneider and Mrs. George Sayer, volunteers were recruited and trained to staff the desk seven days per week.

Special events during the year included a lecture by Gerald Durrell which was held at the Masonic Auditorium and attended by 2,500 persons. A two-day symposium "In Search of Man" was co-sponsored with the L. S. B. Leakey Foundation, and held at the Palace of Fine Arts. The 1,000 capacity auditorium was filled for the lectures by Raymond Dart, Mary Leakey, Jane Goodall, Dian Fossey, Clark Howell, Desmond Clark, David Hamburg, and Richard Hay.

A special Docent Council project was two large maps for Simson African Hall. With one map are Mrs. Thomas Pickford, Chairman of the Docent Council, Mrs. Willard Norberg, coordinator of the project, and Dr. Robert T. Orr, Associate Director of the Academy.



Right: Registration day for the Junior Academy summer classes. Far right: Field studies are part of the Junior Academy's class program. Below: Astronaut Alfred M. Worden was Guest of Honor at the Science Fair Awards night, and following an inspirational talk he presented awards to the Junior Scientist contest winners.



DOCENT COUNCIL

Mrs. Thomas Pickford, Chairman, and Diane Butler, Secretary-Coordinator. One hundred and ten active docents conducted tours for nearly 10,000 students and other visitors who came in 417 groups. An in-school program continued to expand: nearly 800 students were visited in their classrooms by the in-school docent team.

Docents were official hostesses for Academy functions, including the Open House, Leakey Foundation Symposium, and other public lectures.

A special project of the year was the designing, fabrication, and installation of two large maps for Simson African Hall. This was coordinated by Mrs. Willard Norberg.

The basic training course of 22 weeks was presented by Dr. Robert T. Orr and other Academy scientists, and was completed by 28 new docents. An aquarium course was organized by Dr. John McCosker, and presented with the assistance of other staff members.

Two hundred and twenty-five persons have been trained to be docents during the past five years.

EDUCATION OFFICE

Lysbeth Fritz, Education Coordinator. An Education Office was opened at the beginning of this fiscal year, to coordinate and expand the many diverse activities in the general area of education—classes, seminars, and members' travel. University credit was made available for most courses through San Francisco State University's extension division.

Fifteen adult courses were given beginning in January 1974, for which 320 students enrolled.



JUNIOR ACADEMY

Kenneth E. Lucas, Supervisor. The California Junior Academy of Sciences is for young people who are interested in science. There were 515 members who took one or more of the 29 courses offered during the year. For many youngsters the Junior Academy provides a first experience with scientific method, and for all the discipline of observing and measuring and evaluating is valuable. Many medical doctors, biologists, chemists and geologists were introduced to science in the Junior Academy.

The Junior Academy is staffed by young people, some still undergraduates. Courses taught include physical, biological, earth, and ecological sciences. Field trips and field work are integral parts of the program.

The Junior Academy facilities have increasing use for orientation sessions for visiting school classes, and by the adult education programs offered by the Academy.

J. W. MAILLIARD, JR. LIBRARY

Ray Brian, Librarian. The library undertook the classification of incoming books under the Library of Congress system, rather than the long-used Dewey Decimal system which is inadequate for large special technical collections. Selected units of the present holdings were also converted.

Costs of books increased fifteen percent, to an average of \$21.27, and periodicals increased twelve percent, to \$24.02. During the year, 442 books and 357 serial titles were purchased, and 373 volumes were bound. Exchange agreements were maintained for the publications of 610 other learned institutions, an important source of specialized journals.

PACIFIC DISCOVERY

Bruce Finson, Editor: Johan Kooy, Art Director. During 1973-74 the Academy's man-and-nature magazine published 31 articles, eight of them by staff members. Since its founding in 1948, the magazine has traditionally discussed the natural history of the Pacific Basin, but in recent years the coverage has become global. While popular in character, *Pacific Discovery* is increasingly well received in the biology profession, and is now indexed in *Biological Abstracts*. The Printing Industries of America selected *Pacific Discovery* for a 1974 Graphics Arts Award.

George E. Lindsay is Managing Editor, and Robert C. Miller, Robert I. Bowman and Robert T. Orr are Associate Editors. Six issues of *Pacific Discovery* are published each year.

PICTURE COLLECTION

Johan Kooy, Chairman. The picture collection houses the single largest collection of nature illustrations within the state. These photographic prints, slides, art works, and published pictures are used within the Academy's research and educational departments and are available for use by the community. Thousands of loans are made annually from the slide and negative collection administered by Associate Miss Muriel French. Nineteen other dedicated volunteers generously give their time to processing a mountain of incoming and outgoing pictures. A new project undertaken during the year was that of organizing a fine collection of postage stamps dealing with subjects related to the Academy's interests. It is to be used for exhibit and publication. Gifts pictorial and financial from numerous sources account for the considerable growth of this department during the past year.

Left: One of two sea lions sculpted and given to the Academy by Victor J. "Trader Vic" Bergeron. The sea lions flank the entrance of Steinhart Aquarium. Right: An exhibit of selections from the vast collection of Carl Austin Rietz to acknowledge the acquisition of his important assemblage of rare Peruvian textiles and food artifacts from all over the world. The collection was acquired through the Food Technology Foundation. Below, A NASA display with the space suit worn by Alfred M. Worden on the Apollo 13 mission was featured in Hohfeld Gallery.



EXHIBITS DEPARTMENT

Ernest R. Rook, Curator. The Exhibits Department is responsible for the permanent and the special presentations in all of the museum halls, and for the visitors' impression of the institution.

Hohfeld Gallery featured temporary shows which included Henry Evans' flower prints, serigraphs of cave paintings by Douglas Mazonowicz, exceptional underwater photographs by Edwin Janss, and a NASA display with the space suit worn by Alfred M. Worden on the Apollo 13 mission.

Lovell White Hall held a Children's Whale Art show sponsored by Project Jonah. The drawings and paintings of whales by children from across the United States were later delivered to the government of Japan in an appeal to save

whales from further commercial exploitation and extinction. Later, the show "Selections from the Rietz Collection" previewed treasures recently acquired by the Academy in preparation for future Hall of Man exhibits. The Food Technology Foundation provided funds for inventorying and storing this new resource.

Important additions were made in the Gem Room and Mineral Hall, through the generosity of Mr. and Mrs. L. K. Land and Mr. Victor J. Bergeron. Mr. Bergeron was also responsible for the indefinite loan of a Bufano bear sculpture from the San Francisco Museum of Art. The piece, commissioned by Mr. Bergeron and later given to the Museum, is now exhibited in the Academy's Whale Fountain Court.

The Academy is indebted to Professors F. Clark Howell and Claudia Carr, and to Yves Coppens of the Musée de L'Homme of Paris, and to Gerald Eck and other authorities for their continuing generous counsel and technical advice to Richard Cook in the preparation of the African Origins of Man exhibit. It is also indebted to many other volunteers who regularly help the exhibits department. Mrs. Painter Douglass and Mrs. Thelma Owen inventoried the enormous and valuable Charles de Young Elkus and Ruth C. Elkus Indian and Eskimo collection. Mrs. John McCosker inventoried the musical instruments and used them in her world music course. Mr. James Griffith provided specimens and assistance to taxidermist Fred Funk in the renovation of North American Hall dioramas. Many other volunteers gave their time and energy regularly and generously to the Exhibits Department.

PUBLIC INFORMATION

Hal Richardson, Public Information Officer. Mr. Richardson writes the monthly *Newsletter*, books speakers for the members' meetings, and tells the world about the many activities and events and special attractions at the Academy. The continued cooperation of all news media—press, radio, and television—who provided free space or time for Academy publicity, was important and appreciated.

Mrs. Grace Curtis completed a three-year volunteer project utilizing historic records and Mrs. Walther Buchen continued the maintenance of press books.

INSTRUMENT SHOP

Steven B. Craig, Superintendent. The Instrument Shop provided services for all departments of the Academy. Special instruments and optical equipment were designed and built, instruments were repaired, and in-house printing was done. Electrical and lock work was also the shop's responsibility.

Academy designed and fabricated Foucault Pendulums were installed at Dartmouth College and the University of Costa Rica.

Steven Craig and Frank DeOme were particularly involved in the planning for electrical services and security in the new buildings, in cooperation with the architects and the Schlage Lock Company.

RESEARCH ACTIVITIES

The California Academy of Sciences is a center for the exploration and interpretation of natural science. It is the repository for and guardian of vast collections of scientific specimens. It sponsors research based on those collections and on field exploration, and it publishes the results of scientific investigations.

There are seven research departments and collections

at the Academy, and their activities are briefly reported here.

BOTANY

Elizabeth McClintock, Chairman and Curator. Ten thousand plant specimens were added to the herbarium, which had 574,500 at the end of the year.

Dr. McClintock conducted field work in Colombia in January 1974. Dr. Dennis Breedlove spent November in western and central Mexico studying the Onagraceae, or evening primrose family, but most of his year was devoted to the flora of Chiapas project. His comprehensive book on the botanical ethnography of a Mayan-speaking people of Highland Chiapas, coauthored with Brent Berlin and Peter H. Raven, was published, completing an enormous project carried on since 1964.

Dr. John H. Thomas conducted field work in eastern Nevada in August, and taught the Fall Quarter of 1973 at the Stanford University campus in Beutelsbach bei Stuttgart, Germany. Mr. John Thomas Howell and Mr. Gordon H. True continued studies of the flora of the Sierra Nevada.

During the year, 4,900 specimens were loaned to other herbaria, and 1,601 visitors came seeking botanical information or to use the collections.

Much staff time was invested in the planning for the new Botany Department which was under construction in the Wattis Hall of Man building. Upon completion of that structure in 1975, Dudley Herbarium of Stanford University will be moved to the Academy, to create one of the major plant collections in the United States.

ENTOMOLOGY

Dr. Paul H. Arnaud, Jr., Chairman and Curator. The insect collections contain about 6,062,527 specimens, 126,181 having been accessioned during the year. And 110,760 specimens were loaned to 197 persons in the United States and fifteen foreign countries.

The National Science Foundation provided \$44,100 for curatorial support and equipment for the Entomology Department, and two technical assistants and a one-half time assistant curatorial position were supported by that grant.

Mr. Hugh B. Leech retired from active service in November, and Mr. David H. Kavanaugh was appointed Acting Assistant Curator of Coleoptera on April 1, 1974.

Research activities of staff members consisted primarily of the preparation and completion of manuscripts, of which there were many. Research associates in residence were also productive. Of particular note was the continued work on scorpions by Dr. Stanley C. Williams, who has built the Academy's scorpion collection into what is probably the largest and most comprehensive in the world. Dr. Cornelius B. Philip investigated horseflies and other insects of medical significance.

The Entomology Department will also move into new quarters in the Wattis Hall of Man building in 1975, and considerable time was spent completing plans for the new facilities.

GEOLOGY

Peter U. Rodda, Chairman and Curator. Accessions of fossils and Recent shells numbered 1,053 lots, to make a total of 54,803 lots in the collections. Sixty-three specimens were added to the type collection, for a total of 14,018, and 470 specimens were added to the mineral collection, which now has 9,364 specimens. Mr. and Mrs. L. K. Land, Mr. Victor J. Bergeron, Miss Josephine Scripps, Mr. Henry A. Martin and Mr. Leo Rosenhahn donated particularly noteworthy mineral specimens.

Mrs. G Dallas Hanna managed the diatom office and collections as a volunteer and Dr. VanLandingham's research was carried on there with support from The National Science Foundation.

HERPETOLOGY

Alan E. Leviton, Chairman and Curator. During the fiscal year, 1109 specimens of reptiles and amphibians were accessioned and the Academy now has approximately 220,000 in addition to unprocessed material. There were several significant additions, including collections from the central Sahara by Ted Papenfuss, southern Saudi Arabia

by John Gasperetti, and Japan by Steven C. Anderson. Mr. and Mrs. Elkan Morris, Ted Papenfuss and Patricia Haneline contributed Mexican lizards and snakes, and Drs. Walter Brown and Angel Alcala collected more than 2,000 specimens of Philippine amphibians and reptiles during a National Science Foundation sponsored study and these have been deposited at the Academy but are not yet accessioned into the collections.

Through the generosity of Mr. and Mrs. Elkan Morris, Robert Drewes and Ted Papenfuss participated in an expedition to Tamanrasset in central Algeria, where six weeks were spent in field studies and collecting in a herpetologically little-known and zoogeographically critical area.

Dr. Leviton served as Coordinator of the Work-Study Program for students under the Economic Opportunity Act. Twenty-six students were employed; eighteen from San Francisco State University, five from the University of San Francisco, two from Lone Mountain College, and one from the University of California, Berkeley. The Academy supplied 30 percent of the salaries, and by providing these matching funds as well as the work opportunity it enabled the students to remain in school and continue their educations.



Laurence C. Binford, Chairman of the Ornithology and Mammalogy Department, told members about the work of his department during the annual Open House.

Left: John Kipping, center, instructing students in his "Indian Uses of Plants" class, one of a series offered for adults through the newly established Education Office. Right: The Fungus Fair, presented by the San Francisco Mycological Society, was one of many special events held in the Academy halls during the year.



ICHTHYOLOGY

William N. Eschmeyer, Chairman and Curator. During the year about 5,800 specimens representing 950 lots were accessioned and an additional 5,000 specimens of carangid fishes were received from the Tropical Atlantic Biological Laboratory in Miami. The Academy received \$33,600 from the National Science Foundation for curatorial support of the collection, which contains about 171,000 lots.

During the year, 9,969 specimens were loaned to 57 individuals at 44 institutions, and a teaching collection was given to the University of California, Santa Cruz. Approximately 95 visitors used the collection for serious research purposes, many for extended periods.

Dr. Eschmeyer conducted field studies of scorpionfishes in South America but his research emphasis was on North Pacific rockfishes as part of an NSF-sponsored investigation with Dr. Lo-chai Chen. He completed a review of venomous stonefishes. Dr. Warren C. Freihofer continued his studies of nerve patterns and their relationship to the phylogeny of fishes, with support of an NSF grant. Dr. Tomio Iwamoto's principal research was on grenadier fishes, an important group of deepsea fishes, and four papers were published during the year. Mr. W. I. Follett completed several projects on fossil fish remains and continued work on the list of California fishes with Carl L. Hubbs and Lillian Dempster. Miss Pearl Sonoda's large work on Berycomorph fishes with Loren P. Woods, completed while she was employed by the Field Museum of Natural History, appeared in the *Fishes of the Western North Atlantic*.

Dr. Eschmeyer replaced Dr. Lindsay as the Academy representative for the Association of Systematics Collections.

INVERTEBRATE ZOOLOGY

Welton L. Lee, Chairman and Curator. Dr. Lee, who was formerly on the faculty of Hopkins Marine Station of Stanford University, was employed by the Academy to direct the rapidly expanding Invertebrate Zoology Department on July 1, 1973.

The collection contains more than 50,000 lots of invertebrates and includes marine, fresh water and terrestrial forms. Mollusks, opisthobranchs, chitons, barnacles and terrestrial isopods are especially well represented. There are 608 specimens in the type collection, and there are more which have not yet been segregated from the general collection and the recently received Hopkins Marine Station collection.

The physical facilities of the department were expanded with new office areas, and the laboratory was remodeled. There is still a critical space shortage for collections, which may be resolved by reassignment of collection storage areas after the completion of the Wattis Hall of Man addition.

Dr. Lee has initiated a project called the San Francisco Bay Invertebrate Reference Collection with grant support from the David and Lucile Packard Foundation and the National Science Foundation. This will provide readily available data and collections which are essential for present and continuing monitoring of the aquatic environment of the area. Dr. James E. Sutton heads that project.

Dr. Lee is Chairman of the National Advisory Committee on Invertebrate Collections and is Chairman of the "Subcommittee on Preservation" of the Association of Systematics Collections Council on Standards.

ORNITHOLOGY AND MAMMALOLOGY

Laurence C. Binford, Chairman and Associate Curator. On July 1, 1973 Dr. Binford was promoted to Associate Curator and appointed Chairman of the Department, succeeding Dr. Robert T. Orr who had carried that responsibility for twenty-nine years. Dr. Orr was increasingly occupied as Associate Director of the Academy and Secretary of the Pacific Division of the American Association for the Advancement of Science, and with training courses for Academy docents, leading Academy members' trips, and with conservation committees and professional societies.

The year ended with 82,445 birds and 21,030 mammals in the collections, 114 birds and 354 mammals having been accessioned during the year. Many of these were from Dr. John R. Arnold's faunal studies in Oaxaca, Mexico. Other notable accessions included the second and third Rough-toothed Dolphins recorded from the eastern Pacific which were found beach-stranded by Field Associate Peter Allen; 72 Black-tailed Deer skulls from Ian McAtee Cowan; and 57 small mammals from Alaska collected by Research Associate J. Dan Webster. During the year, 401 birds and 372 mammals were loaned to other institutions and 139 scientists and 116 graduate students visited the Department.

Dr. Binford conducted field studies in Africa and in Oaxaca, Mexico. He was President of the Board of the

Point Reyes Bird Observatory and held offices with several ornithological organizations.

Jacqueline Schonewald participated in the Oaxaca expedition, and managed much of the curatorial and public contact work of the Department.

SCIENTIFIC PUBLICATIONS

Edward L. Kessel, Editor; and Diana R. Young, Assistant Editor. The publication of the results of research is perhaps more important than the research itself, because unpublished research is a waste and is lost to the scientific community.

The Academy published 812 pages of scientific papers during the year—365 pages of *Proceedings*, 188 pages of Occasional Papers, and 259 pages in one volume of the *Memoir* series.

The Publications Committee consisted of George Lindsay, Chairman; Edward L. Kessel, Paul H. Arnaud, Jr., William N. Eschmeyer, and Alan E. Leviton.

George E. Lindsay
GEORGE E. LINDSAY
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Fellows Reception and Banquet on October 27, 1973.

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During the year many of the Academy's activities were augmented by volunteers who generously donated their time and services. Some assisted in the various departments: typing, cataloging, and performing other necessary tasks, while others served as docents after completing the docent training courses. We are most grateful to the following:

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Key to department abbreviations:

Aq—Aquarium
Bo—Botany
DO—Development Office
Do—Docents
En—Entomology
Ex—Exhibits

Ge—Geology
He—Herpetology
HS—High School Project
Ic—Ichthyology
ID—Information Desk
IS—Instrument Shop

IZ—Invertebrate Zoology
Li—Library
OM—Ornithology and Mammalogy
PC—Picture Collection
PI—Public Information
Ta—Taxidermy

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STAFF BIBLIOGRAPHY

1973-74

ALCALA, ANGEL C.

1974 (See: Brown, Walter C.)

ARNAUD, PAUL H., JR.

1973 Thomas Wrentmore Cook (1884-1962). Pan-Pacific Ent., vol. 49, pp. 177-181. (Co-author: Mary Manning Wale.)

1974 *Polistiopsis mima* Townsend (Diptera: Tachinidae) in Costa Rica. Pan-Pacific Ent., vol. 50, p.

— Insects and a mite associated with stored *Cannabis sativa* Linnaeus. Pan-Pacific Ent., vol. 50, p.

— *Paradejeania rutilioides nigrescens* Arnaud reared from *Hemihyalae* sp. (Diptera: Tachinidae: Lepidoptera: Arctiidae). Pan-Pacific Ent., Vol. 50, p.

BREEDLOVE, DENNIS E.

1973 The Phytogeography and Vegetation of Chiapas (Mexico). In: Vegetation and Vegetational History of Northern Latin America, A. Graham, ed. Elsevier Press, New York, pp. 149-165.

— Cultural Significance and Lexical Retention in Tzeltal-Tzotzil Ethnobotany. In: Meaning in Mayan Languages, M. S. Edmonson, ed. Mouton Press, The Hague, pp. 143-164. (Co-authors: B. Berlin, R. M. Laughlin, P. H. Raven.)

1974 Principles of Tzeltal Plant Classification: An Introduction to the Botanical Ethnography of a Mayan Speaking People of Highland Chiapas. Seminar Press, New York, 660 pp. (Co-authors: B. Berlin, P. H. Raven.)

— Alkaloid and predation patterns in Colorado lupine populations. Oecologia, vol. 13, pp. 191-204. (Co-authors: P. M. Dolinger, P. R. Ehrlich, W. L. Fitch.)

BRIGGER, A. L.

1973 (SEE: Mandra, York T.)

BRIGGS, THOMAS S.

1974 Phalangodidae from caves in the Sierra Nevada (California) with a redescription of the type genus. Occ. Pap. California Acad. Sci., no. 108, 15 pp.

BROWN, WALTER C.

1974 New frogs of the genus *Platymantis* (Ranidae) from the Philippines. Occ. Pap. California Acad. Sci., no. 113, 12 pp. (Co-author: A. C. Alcala.)

BURGHARDT, GLENN E.

1973 A new Hawaiian chiton, *Rhyssoplax linsleyi* (Mollusca: Amphineura: Chitonidae). Proc. California Acad. Sci., ser. 4, vol. 39, pp. 501-506.

1974 Tips from a fish show judge. Golden Gate Aquarist (SFAS), vol. 2, no. 2, pp. 9-10.

CASTRO, ALFRED

1974 President's message. Golden Gate Aquarist (SFAS), vol. 2, nos. 1-6.

— The odds are?? Golden Gate Aquarist (SFAS), vol. 2, no. 4, p. 5.

CHESTERMAN, CHARLES W.

1973 Geology of the northeastern quarter of the Shoshone Quadrangle, Inyo County, California. California Div. Mines & Geol., Geol. Map 18.

DEMPSTER, ROBERT P.

1973 Common marine diseases and their treatment. Marine Hobbyist News, vol. 1, no. 10, pp. 1, 4.

1974 The new Steinhart Aquarium. Marine Hobbyist News, vol. 2, no. 2, pp. 3-5.

— Some interesting facts about water. Golden Gate Aquarist (SFAS), vol. 2, no. 5, pp. 9-12.

DREWES, ROBERT C.

1973 The occurrence of the colubrid snake, *Psammophis pulcher*, in Kenya. Herpetologica, vol. 29, pp. 306-307. (Co-author: S. Spawls.)

1974 A new population of carpet vipers, *Echis carinatus*, from northern Kenya. Jour. East African Nat. Hist. Soc. & Nat'l. Mus., no. 145, 7 pp. (Co-author: J. Sacherer.)

ESCHMEYER, WILLIAM N.

1973 Two new species of the scorpionfish genus *Rhinopias*, with comments on related genera and species. Proc. California Acad. Sci., ser. 4, vol. 39, pp. 285-310. (Co-authors: Y. Hiro-saki, T. Abe.)

— Two new stonefish (Pisces, Scorpaenidae) from the Indo-West Pacific with a synopsis of the subfamily Synanceiinae. Proc. California Acad. Sci., ser. 4, vol. 39, pp. 337-382. (Co-author: K. V. Rama Rao.)

1974 Location of holotypes of Japanese fishes (Jordan and Starks, 1906) and types of Hawaiian fishes (Jordan and Evermann, 1903). Copeia, 1974, no. 2, pp. 566-569. (Co-author: V. G. Springer.)

ETIENNE, CLAIRE E.

1974 The spectacular flannel bushes. Fremontia, vol. 2, pp. 8-10.

FINSON, BRUCE

1973 A guide to the California Academy of Sciences. California Academy of Sciences, San Francisco, 32 pp., 40 col. illus.

— Walking the Panhandle. California Living, Oct. 21, 1973, pp. 10-12.

1974 Volcanos in the desert. Desert, vol. 47, no. 1, pp. 16-19.

— Tufa City. Pacific Discovery, vol. 27, no. 2, pp. 14-20.

FOLLETT, W. I.

1973 Fish remains of the Church Rock-shelter, Mnt-44, Monterey County, California. Monterey Co. Archaeol. Soc. Quart., vol. 2, no. 4, pp. 10-11.

— Comments on the proposed suppression of the *nomina oblita* in the family Echeineididae (Pisces) Z. N. (S.) 1967. Bull. Zool. Nomen., vol. 30, p. 76. (Co-authors: B. B. Collette, C. R. Robins, D. W. Strasburg.)

1974 Fish remains from site NV-WA-197, Winnemucca Lake, Nevada. Contrib. Univ. California, Archaeol. Res. Fac., no. 21, pp. 37-43, pls. 1-2.

— (See: Myers, George S.)

HOWELL, JOHN THOMAS

1973 A lectotype for the Hinds walnut. Madroño, vol. 22, p. 144.

— A new California record for *Filago vulgaris*. Madroño, vol. 22, p. 151.

— Notes on *Arabis* in the Sierra Nevada. Fremontia, vol. 1, pp. 13-16.

— Supplement to the Vascular Plants of Monterey County, California. Pacific Grove Mus. Nat. Hist. Assoc., Pacific Grove, California, 60 pp. (Co-author: B. F. Howitt.)

1974 A new Sierran *Sidalcea*. Four seasons, vol. 4, pp. 20-22. (Co-author: G. H. True.)

HUBBS, CARL L.

1974 Hydrographic History and Relict Fishes of the North-Central Great Basin. Mem. California Acad. Sci., vol. 7, 259 pp.

IWAMOTO, TOMIO

1973 Macrourids (Gadiformes: Pisces) collected off Angola by the R/V UNDAUNTED with the description of a new species. Proc. Biol. Soc. Washington, vol. 86, pp. 373-384.

— Genus *Coelorhynchus* Giorna 1809. Genus *Coryphaenoides* Gunnerus, 1765. Genus *Hymenocephalus* Giglioli 1882. Genus *Nezumia* Jordan 1904. In: Fishes of the Western North Atlantic. Mem. Sears Foundation Marine Res., no. 1, pt. 6, pp. 538-563, 565-580, 601-612, 624-649. (Co-author: N. B. Marshall.)

- 1974 *Nezumia (Kuronezumia) bubonis*, a new subgenus and species of grenadier (Macrouridae: Pisces) from Hawaii and the western North Atlantic. *Proc. California Acad. Sci.*, ser. 4, vol. 39, pp. 507-516.

— Systematic review of the rattail fishes (Macrouridae: Gadiformes) from Oregon and adjacent waters. *Occ. Pap. California Acad. Sci.*, no. 111, 79 pp. (Co-author: D. L. Stein.)

KESSEL, EDWARD L.

- 1973 A survey of the known larvae and puparia of Platypezidae, with a key to the ten genera based on immature stages (Diptera). *Wasmann Jour. Biol.*, vol. 31, pp. 233-261. (Co-authors: M. E. Buegler, P. M. Keyes.)

LEECH, HUGH B.

- 1973 A biological note on two species of *Ageniella* from California (Hymenoptera: Pompilidae). *Pan-Pacific Ent.*, vol. 49, pp. 182-183. (Co-author: M. S. Webster.)

LINDSAY, GEORGE E.

- 1973 Annual Report of the Director, California Academy of Sciences, 1972-73. California Academy of Sciences, San Francisco, 24 pp.

- 1974 Dennis Breedlove and the Flora of Chiapas. *Pacific Discovery*, vol. 27, no. 1, pp. 1-9.

— Earl S. Herald, Director, Steinhart Aquarium, 1948-1973. *The Drum and Croaker*, vol. 15, no. 1, p. 3.

MANDRA, YORK T.

- 1973 Chemical extraction techniques to free fossil silicoflagellates from marine sedimentary rocks. *Proc. California Acad. Sci.*, ser. 4, vol. 39, pp. 273-284. (Co-authors: A. L. Brigger, H. Mandra.)

— Temperature fluctuations during the late Eocene in southern ocean waters near South Island, New Zealand. *Antarctic Jour. United States*, vol. 8, pp. 282-284. (Co-authors: A. L. Brigger, H. Mandra.)

McCLINTOCK, ELIZABETH

- 1973 Rare and endangered—the story of San Francisco's dune tansy. *Fremontia*, vol. 1, pp. 8-10.

— Climbing hydrangeas. *California Horticult. Jour.*, vol. 34, pp. 141-145.

— The generic name *Wisteria*. *California Horticult. Jour.*, vol. 34, p. 159.

- 1974 Magnolias in the Strybing Arboretum, San Francisco. *International Dendrology Soc. Year Book 1973*, pp. 44-52.

MCCOSKER, JOHN E.

- 1973 Feeding behavior of Indo-Australian Hydrophiidae. *Res. Repts., Alpha Helix Research Program, 1972-1973*, Univ. California, San Diego, 2 pp.

— Two additional west Atlantic gobies (genus *Gobiosoma*) that remove ectoparasites from other fishes. *Copeia*, 1973, no. 3, pp. 609-610. (Co-author: J. E. Bohlke.)

— Determination of sea snake venom lethality in fishes. *Res. Repts., Alpha Helix Research Program, 1972-1973*, Univ. California, San Diego, 2 pp. (Co-authors: H. W. Puffer, N. Tamiya.)

— Respiration studies of the pearlfish *Carpus homeii* (Richardson). *Res. Repts., Alpha Helix Research Program, 1972-1973*, Univ. California, San Diego, 2 pp. (Co-author: R. Seymour.)

MYERS, GEORGE S.

- 1974 In Memoriam: Earl Stannard Herald. *Copeia*, 1974, no. 1, pp. 291-292. (Co-authors: W. I. Follett, W. A. Gosline.)

ORR, ROBERT T.

- 1973 Galápagos fur seal (*Arctocephalus galapagoensis*). In: *Seals. International Union Conserv. Nature & Nat. Resour.*, n.s., suppl. pap. 39, pp. 124-128.

PHILIP, CORNELIUS B.

- 1973 Diptera: Tabanidae from Ceylon. *Entomologica Scandinavica*, Suppl. 4, pp. 56-62.

— Table 128. Rickettsial parasites: Mammals and birds. In: *Biological Data Book*, 2nd ed., Philip L. Altman and Dorothy S. Dittmer, eds., vol. 2, pp. 1092-1093.

- 1974 Notes on eastern Nearctic *Haematopota*, *Merycomyia*, and *Chrysops*, and description of male *C. zinzelus* (Diptera: Tabanidae). *Florida Ent.*, vol. 56, pp. 339-346. (Co-authors: H. V. Weems, Jr., G. B. Fairchild.)

ROSS, EDWARD S.

- 1973 Insect Overview: a Pictorial Introduction to the World of Insects. Syllabus for Introductory Entomology. Brigham Young Univ. Press, Provo, Utah, 25 pp.

— Inside a termite mound. *Ranger Rick's Nat. Mag.*, vol. 7, pp. 32-34.

- 1974 Ants can be odd. *Ranger Rick's Nat. Mag.*, vol. 8, pp. 46-47.

ROTH, BARRY

- 1973 *Sterkia hemphilli* (Sterki) in central California. *Veliger*, vol. 16, p. 117.

— The systematic status of *Helminthoglypta traskii fieldi* Pilsbry, 1930 (Gastropoda: Stylommatophora). *Bull. Southern California Acad. Sci.*, vol. 72, pp. 148-155.

— A review of the Marginellidae described by Bavay, 1903-1922. *Veliger*, vol. 16, pp. 207-215. (Co-author: P. W. Clover.)

SMITH, ALLYN G.

- 1973 Mussel shells from Bamert Cave, Amador County, California. In: *The Archaeology of Bamert Cave; Amador County, California*, by Robert F. Heizer and Thomas R. Hester. *Archaeol. Res. Fac., Dept. Anthro., Univ. California, Berkeley*, Appendix 8, p. 79.

— Polyplacophora—a selected bibliography. *Of Sea and Shore*, (Winter 1973-74), pp. 201-206, 208.

- 1974 Type and other Cephalopoda in the collection of the Department of Invertebrate Zoology, California Academy of Sciences. *Veliger*, vol. 16, pp. 319-333.

— Galápagos bulimulids: a taxonomic correction. *Nautilus*, vol. 88, p. 67.

SONODA, PEARL M.

- 1973 Order Berycomorphi (Beryciformes). In: *Fishes of the Western North Atlantic. Mem. Sears Foundation Marine Res.*, no. 1, pt. 6, pp. 263-396. (Co-author: L. P. Woods.)

SWITAK, KARL H.

- 1973 California's desert tortoise. *Pacific Discovery*, vol. 26, no. 5, pp. 9-15.

- 1974 Duel in the sun. *Nat'l. Wildlife*, vol. 12, no. 2, pp. 14-15.

— Adventures in green python country. *Internat'l. Wildlife*, vol. 4, no. 2, pp. 12-16.

THOMAS, JOHN H.

- 1973 Alkaloids of *Acacia baileyana*. *Lloydia*, vol. 36, pp. 211-213. (Co-authors: D. B. Repke, D. M. Mandell.)

— Wallace Roy Ernst, 1928-1971. *Madroño*, vol. 22, pp. 207-213. (Co-author: S. G. Shelter.)

- 1974 Native Shrubs of the Sierra Nevada. Univ. California Press, Berkeley, 127 pp. (Co-author: D. R. Parnell.)

TRUE, GORDON H.

- 1974 (See: Howell, John Thomas)

VANLANDINGHAM, SAM L.

- 1973 Micropaleontology and paleoecology of Miocene non-marine diatoms from the Harper District, Malheur County, Oregon. *Nova Hedwigia*, vol. 23, pp. 847-906.

CALIFORNIA ACADEMY OF SCIENCES
BALANCE SHEETS — JUNE 30, 1974

ASSETS	Current funds General operating	Restricted to research	Unexpended plant improvements	Special purposes	Endowment fund	Building fund
Cash:						
Commercial accounts	\$ 10,673	\$ 21,493	\$ 4,500	\$ 32,940	\$ 568	\$ 4,357
Savings accounts	—	—	38,203	16,419	3,216	66,689
	<u>10,673</u>	<u>21,493</u>	<u>42,703</u>	<u>49,359</u>	<u>3,784</u>	<u>71,046</u>
Receivables:						
Notes receivable	—	—	—	10,000	—	—
Research grants (note 2)	—	180,333	—	—	—	—
City and County of San Francisco	17,101	—	—	—	—	—
Accrued interest and dividends receivable	21,658	—	—	8,690	—	6,464
Contracts receivable	11,841	—	—	—	—	—
Other	49,123	—	—	—	—	—
	<u>99,723</u>	<u>180,333</u>	<u>—</u>	<u>18,690</u>	<u>—</u>	<u>6,464</u>
Inventory of guidebooks, at cost	12,397	—	—	—	—	—
Prepaid expenses	8,316	—	—	—	—	—
Investments (note 3):						
Commercial property, including a fully depreciated building	—	—	—	—	608,084	—
Marketable securities	—	—	9,063	1,035,787	2,249,061	708,112
	<u>20,713</u>	<u>—</u>	<u>9,063</u>	<u>1,035,787</u>	<u>2,857,145</u>	<u>708,112</u>
Due from other funds	—	8,656	1,194	—	72,315	—
Buildings (note 4)	—	—	—	—	—	—
Collections, library and equipment (note 5)	—	—	—	—	—	—
Unamortized lease commissions (amortized on the straight-line basis over 40 years)	6,978	—	—	—	—	—
	<u>6,978</u>	<u>8,656</u>	<u>1,194</u>	<u>—</u>	<u>72,315</u>	<u>—</u>
Total assets	<u>\$138,087</u>	<u>\$210,482</u>	<u>\$52,960</u>	<u>\$1,103,836</u>	<u>\$2,933,244</u>	<u>\$785,622</u>
LIABILITIES AND FUND BALANCES						
Accounts payable	27,722	683	—	877	—	1,001
Accrued expenses	3,007	—	—	—	—	—
Other liabilities	12,336	—	—	—	—	—
Due to other funds	77,562	—	—	4,541	—	62
	<u>120,627</u>	<u>683</u>	<u>—</u>	<u>5,418</u>	<u>—</u>	<u>1,063</u>
Fund balances	17,460	209,799	52,960	1,098,418	2,933,244	784,559
Total liabilities and fund balances	<u>\$138,087</u>	<u>\$210,482</u>	<u>\$52,960</u>	<u>\$1,103,836</u>	<u>\$2,933,244</u>	<u>\$785,622</u>

See accompanying notes to financial statements.

CALIFORNIA ACADEMY OF SCIENCES
STATEMENT OF CURRENT FUND—GENERAL OPERATING
REVENUES AND EXPENDITURES
YEAR ENDED JUNE 30, 1974 WITH COMPARATIVE FIGURES FOR 1973

	1974	1973
Revenue:		
Support from the public:		
Corporate contributions	\$ 39,570	\$ 34,930
Individuals, trusts and private foundations	63,074	64,810
Membership dues	104,746	104,317
Total support from the public	<u>207,390</u>	<u>204,057</u>
Operating income:		
From the City and County of San Francisco		
for support of operations	685,870	590,970
Fees and grants from others	42,433	32,024
Planetarium	132,234	131,335
Admissions	314,892	337,679
Sales desk royalty	18,666	19,577
Restaurant royalty	59,590	59,039
Other	52,511	40,728
Total operating income	<u>1,306,196</u>	<u>1,211,352</u>
Investment income:		
Net rent from commercial building	205,330	153,830
Interest and dividends	131,700	113,050
Total investment income	<u>337,030</u>	<u>266,880</u>
Total revenue	<u>1,850,616</u>	<u>1,682,289</u>
Expenditures:		
Aquarium and museum	820,532	714,145
Departmental research and curatorial activity	452,055	405,474
Planetarium	81,211	80,383
General and administrative	496,362	448,291
Employees' pension annuity (note 6)	36,590	34,677
Interest	—	11,094
Total expenditures	<u>1,886,750</u>	<u>1,694,064</u>
Excess of current operating expenditures		
over related income and support	<u>\$ (36,134)</u>	<u>\$ (11,775)</u>

See accompanying notes to financial statements.

CALIFORNIA ACADEMY OF SCIENCES
STATEMENT OF CHANGES IN FUND BALANCES
YEAR ENDED JUNE 30, 1974

	Current fund General operating	Restricted to research	Unexpended plant improvements	Special purposes	Endowment fund	Building fund
Balance at beginning of year	\$11,919	\$246,096	\$65,544	\$ 897,744	\$3,266,509	\$ 130,372
Additions:						
Current revenue, expendable for research as specified by donor	—	190,109	—	—	—	—
Contributions, grants and appropriations for endowments and special purposes	—	—	275	236,804	18,417	1,078,801
Interest and dividend income	—	—	2,579	50,654	—	24,411
Other	—	39,170	60,000	52,690	—	—
Gain (loss) on sale of securities	—	—	—	22,531	29,039	(2,723)
Total additions	—	229,279	62,854	362,679	47,456	1,100,489
Deductions:						
Excess of current operating expenditures over related income and support	36,134	—	—	—	—	—
To finance expenditures of research grants	—	223,143	—	—	—	—
Indirect costs recovered on research grants	—	42,433	—	—	—	—
Amounts expended for furniture and fixtures	—	—	12,410	16,191	—	—
Amounts expended for construction	—	—	—	—	—	708,275
Amounts expended for professional services	—	—	61,380	2,069	—	92,766
Other	—	—	148	103,570	721	25,261
Total deductions	36,134	265,576	73,938	121,830	721	826,302
Transfers between funds	41,675	—	(1,500)	(40,175)	(380,000)	380,000
Balance at end of year	<u>\$17,460</u>	<u>\$209,799</u>	<u>\$52,960</u>	<u>\$1,098,418</u>	<u>\$2,933,244</u>	<u>\$ 784,559</u>

See accompanying notes to financial statements.

ACCOUNTANTS' REPORT

The Board of Trustees
California Academy of Sciences:

We have examined the balance sheets of the funds of the California Academy of Sciences as of June 30, 1974 and the related statement of current fund—general operating revenues and expenditures and statement of changes in fund balances for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned financial statements present fairly the financial position of the California Academy of Sciences at June 30, 1974 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

San Francisco, California
September 25, 1974

PEAT, MARWICK, MITCHELL & Co.
Certified Public Accountants

CALIFORNIA ACADEMY OF SCIENCES
NOTES TO FINANCIAL STATEMENTS
JUNE 30, 1974

1. Summary of Significant Accounting Policies

The Academy uses the accrual method of accounting with revenue being recorded when earned and expenses when incurred. Government grants are recognized in full when awarded. Gifts of specimens and collections which have no established value are not included in the financial statements.

In order to better present the results of current operations, the Academy now reports current general operating revenues and expenditures in lieu of an overall summary of financial activities.

2. Research Grants Receivable

Grants receivable represent amounts pledged to the Academy for certain operations and for the completion of designated projects in future years. The grants will be collected as expenditures are made by the Academy for the designated project. A summary of grants receivable follows:

National Science Foundation.....	\$161,488
Other governmental agencies	18,845
	<u>\$180,333</u>

3. Investments

Investments are recorded at cost or, if acquired by gift, at their fair market value at the date of acquisition. A summary of the current market value of the marketable securities for each fund follows:

	Book value	Market value
Unexpended plant improvements	\$ 9,063	\$ 6,641
Buildings	\$ 708,112	\$ 680,750
Special purposes	\$1,035,787	\$ 845,152
Endowment	\$2,249,061	\$1,803,899

4. Buildings

Under the terms of the Charter of the City of San Francisco, no one other than the City may hold title to buildings on city property. As the Academy facilities in Golden Gate Park were acquired, title was transferred to the City of San Francisco. The buildings, excluding Cowell Hall, were valued at \$14,126,000 by independent appraisal in 1968. Cowell Hall was completed in 1969 at a cost of \$1,545,000.

Construction plans for the Academy's building expansion projects were approved in December, 1973. The Academy's new buildings are being constructed on City park lands. Upon completion of construction, the buildings will be gifted to the City and County of San Francisco. The cost of buildings upon completion will be \$4.4 million. At June 30, 1974, \$825,321 had been expended on the building project.

5. Collections, Library and Equipment

Collections, library, and equipment are expensed in the year of acquisition. The Academy staff has estimated the replacement cost of collections, library, and equipment to be in excess of \$10,000,000.

6. Employees' Pension Annuity

On January 1, 1964, the Academy adopted a pension annuity plan for all regular full-time staff members under the age of 59 as of that date.

Under the provisions of the plan, the Academy and the employees each fund one-half of the pension cost. The Academy's contributions are based on 5% of the amount of salary subject to Social Security tax and 7½ % of the amount of salary above the Social Security tax base. Total pension expense for the year was \$36,590. There is no past service liability, and it is the Academy's policy to fund current pension costs.

7. Trusts

The Academy is the ultimate beneficiary under an irrevocable living trust in the amount of \$154,102 (market value \$117,207). The income of the trust is paid to the grantors and the Academy bears the cost of all trust operations. The assets of the trust are not shown in the accompanying financial statements.

The Academy is the trustee and a fifty percent beneficiary under an irrevocable unitrust agreement which had a book value at June 30, 1974 of \$376,648 (market value \$311,664). Six percent of the net fair market value of the trust assets, valued as of the second Tuesday of the month of January of each taxable year, is paid to the grantor. The trust absorbs the cost of all trust operations. The assets are not shown in the accompanying financial statements. Distributions for fiscal year ended June 30, 1974 totalled \$19,341.

CONTRIBUTIONS

Each year we take great pleasure in acknowledging the support given the Academy by business organizations, private foundations and individuals, whose gifts—past and present—have made possible scientific research, curatorial activities, field expeditions, educational programs and public exhibits. A number of Academy programs are funded either directly through gifts, grants and bequests, or indirectly through income from endowment and contributed property. In terms of capital expenditures, all of the Academy's buildings have been made possible by private benefactions. Because of this continued private support, the Academy is ranked as one of the leading museum-research-educational institutions in the country.

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